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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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25101      7590      03/28/2003

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EXAMINER

EPPERSON, JON D

ART UNIT      PAPER NUMBER

1639

DATE MAILED: 03/28/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary***File Copy*

Application No.

09/729,118

Applicant(s)

CAWSE, JAMES NORMAN

Examiner

Jon D Epperson

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7, 10 and 16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

### **DETAILED ACTION**

**Please note:** The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to **Group Art Unit 1639**.

#### ***Request for Continued Examination (RCE)***

1. A request for continued examination under 37 CAR 1.114, including the fee set forth in 37 CAR 1.17(e), was filed in this application after final rejection (see Paper No. 15). Since this application is eligible for continued examination under 37 CAR 1.114, and the fee set forth in 37 CAR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CAR 1.114. Applicant's submission filed on January 24, 2003 (Paper No. 11) has been entered. The Examiner has elected to make this action non-final to allow applicants an opportunity to reiterate any arguments previously addressed that might still apply to this Action.
2. Please note that the Examiner is acting only on the "twice-amended" claims that have been formally submitted to the Patent Office i.e., Paper No. 11. Any changes to the claims that were discussed in the interview on March 12, 2003 have not been addressed because these amendments have not yet been submitted.

#### ***Status of Claims***

3. Claims 1-7, 10-12 and 16 were pending in the present application. Applicant cancelled 11-12 and 17-36 (claims 17-36 were previously withdrawn by the Examiner in Paper No. 6 pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions and claims 8-9 and 13-15

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were previously cancelled by applicant without prejudice in Paper No. 9) without prejudice and amended claims 1-7. Consequently, claims 1-7, 10 and 16 are currently pending.

4. Therefore, claims 1-7, 10 and 16 are examined on the merits in this action.

### ***Objections to the Claims***

5. Claim(s) 6 is objected to because of the following informalities:

A. It would appear that claim 6 has been inadvertently changed in line 2 from “.04 mm thick” to “04 mm thick” i.e., the decimal point has been removed (see Paper No. 11, page 2). Correction is requested.

### **Withdrawn Rejections and/or Objections**

6. The rejections under 35 U.S.C. 112, first paragraph have been withdrawn in view of applicants' arguments and/or amendments. With respect to the rejections under the second paragraph of 35 U.S.C. 112, the rejections denoted B, C, G and J in Paper No. 10 (see paragraph 19) are withdrawn in view of applicants' amendments to the claims and/or arguments.

### **New Rejections**

***Claims Rejections - 35 U.S.C. 112, second paragraph***

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-7, 10 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- A. The term “reactor plate” in **claim 1** is not defined by the claim or the specification and is an indefinite and/or unclear term. For example, how does the term “reactor” in the phrase “reactor plate” limit the scope of the invention? Does the plate itself “react” as a catalyst? Does the plate contain some sort of “heating element” that promotes the reaction? Furthermore, how does the word “plate” limit the scope of the invention? For example, does the word “plate” encompass only a “flat metallic” surface or could it also include a “concave glass” surface? Furthermore, applicants’ specification presents examples that do not appear to be reactor plates e.g., see figure 4 wherein “two plates” are simply attached via a membrane on each side to form some sort of filter or dialysis bag. Consequently, it is not possible to determine the metes and bounds of the invention as claimed. Therefore, claim 1 and all dependent claims are rejected under 35 U.S.C. 112, second paragraph.
- B. **Claim 1** recites the limitation “the cells” in lines 4 and 6. There is insufficient antecedent basis for this limitation in the claim. Therefore, claim 1 and all dependent claims are rejected under 35 USC 112, second paragraph.

- C. **Claim 1** recites the limitation "the one cell" in line 5. There is insufficient antecedent basis for this limitation in the claim. Therefore, claim 1 and all dependent claims are rejected under 35 USC 112, second paragraph.
- D. The phrase "substrate with an array of reaction cells" in **claim 1** is indefinite and/or unclear. In this context, does the word "with" mean that an array of reaction cells "accompanies" the substrate (i.e., the substrate and the array of reaction cells are two separate items) or does the word "with" show that the "array of reaction cells" is qualifying property that further limits the word substrate (i.e., the substrate and the array of reaction cells are the same item)? For example, in the specification figure 4 could be interpreted in multiple ways e.g., two substrates that do not contain any reaction cells that are subsequently joined together by two permeable polycarbonate film coverings wherein a "reaction cell" is formed by the space made when the two substrates are joined in such a manner OR the picture could also be reasonably interpreted as a "well" containing a bottom and two opposing sides with a permeably polycarbonate film covering the top. Consequently, without any clear definition and in light of the ambiguous nature of the examples provided by applicant in the specification, it is not possible to determine the metes and bounds of the invention as claimed. Therefore, claim 1 and all dependent claims are rejected under 35 U.S.C. 112, second paragraph.

*Response*

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8. Applicants' arguments directed to the above 35 U.S.C. 112, second paragraph rejections i.e., rejections A and D were fully considered but were not deemed persuasive for the reasons outlined below.

9. Applicants argue that "[t]he term in question is "reactor plate," not "reactor" or "plate" alone. Reference to the well-known meaning of "reactor plate in the combinatorial art, limits the scope in this respect, to the well-known meaning of "reactor plate." See Cherukuri et al., 6,331,439, Cherukuri et al., 5,980,704 and Cherukuri et al., 5,603,351. A quick search of the PTO patent data base reveals over 100 patents that use the term. The specification shows several "reactor plates." The specification at least at page 2, lines 19 to 20, defines a "reactor plate" as comprising "a substrate with an array of reaction cells and a permeable film covering at least one of the cells" (see Paper No. 11, page 5, last paragraph).

10. The Examiner contends that a person of skill in the art would not know what a "reactor plate" is in view of applicants specification and, as a result, the metes and bounds of the claimed invention cannot be determined. First, the Examiner points out that none of the references cited above by applicant that are allegedly used to disclose the "well-known" meaning of a "reactor plate" actually use the term "reactor plate" (e.g., Patent Nos. 6,331,439, 5,980,704, 5,603,351) and, as a result, these references cannot be used to convey the "well-known" meaning of the term. Second, the Examiner did not find over 100 patents that use the term "reactor plate" i.e., many of the references had the words together e.g., "plate, reactor" but not the requisite "reactor plate" as disclosed here. Third, the references that did contain the term "reactor plate" had

limitations that are not consistent with Applicant's examples in the specification e.g., these plates had heating elements or inlet and outlet valves that do not appear in applicant's specification. Finally, the "definition" presented in the specification on page 2, lines 19 to 20, does not alleviate the problems stated above because it defines reactor plate using words that are themselves indefinite i.e., "a substrate with an array of reaction cells" (see 35 U.S.C. 112, second paragraph rejection, part "D" above; see also discussion below). Consequently, it is not clear what limitations the term "reactor plate" entails.

11. With regard to the phrase "substrate with an array of reaction cells" applicant argues that the phrase is well known in the combinatorial art and that the phrase is also "defined in the specification with reference to the drawings" wherein "the claims read in light of the specification need only apprise those skilled in the art of the scope of the invention" (see Paper No. 11, page 6, paragraphs 2-4).

12. The Examiner contends that the drawings are ambiguous and would not apprise those skilled in the art of the scope of the invention. For example, figure 4 does not appear to contain a "substrate with an array of reaction cells." Rather, the picture could be reasonably interpreted as two substrates that do not contain reaction cells that are joined together by two permeable films i.e., on the top and bottom thus enclosing a space. The following portion of the 35 U.S.C. 112, second paragraph, part "D" rejection is particularly relevant:

In this context, does the word "with" mean that an array of reaction cells "accompanies" the substrate (i.e., the substrate and the array of reaction cells are two separate items) or does the word "with" show that the "array of reaction cells" is qualifying property that further limits the word substrate (i.e., the substrate and the array of reaction cells are the same item)? For example, in the specification figure 4 could be interpreted in multiple ways e.g., two substrates that do not contain any reaction cells that are subsequently



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joined together by two permeable polycarbonate film coverings wherein a "reaction cell" is formed by the space made when the two substrates are joined in such a manner OR the picture could also be reasonably interpreted as a "well" containing a bottom and two opposing sides with a permeably polycarbonate film covering the top.

Consequently, the metes and bounds of the claimed invention cannot be determined.

### *Claim Rejections - 35 USC § 103*

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1-7, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eigen et al (US Patent No. 5,447,679) (Date of Patent is **September 5, 1995**) and Bottenbruch et al (US Patent No. 4,086,310) (Date of Patent is **April 25, 1978**) and Bayer (Bayer "Mackrofol BL" Application Technology Information **March 21, 1998**, 1-6).

For *claims 1, 10 and 16*, Eigen et al (see entire document) teaches a polycarbonate substrate with an array of reactions cells that contains a polycarbonate monofilm covering (i.e., each of the wells contains "two opposing walls", a concave bottom, and "comprises" a polycarbonate monofilm covering) (see Eigen et al, figures 1-5 and 10; see especially elements 2, 11 and 49; see also column 1 paragraphs 1-3).

Please note that the limitation of “a reactor plate for the catalytic production of aromatic carbonates” in claim 1 represents functional language describing a use of the apparatus, which wouldn’t further limit the scope of the claimed invention. See MPEP § 2114:

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

“[A]pparatus claims cover what a device is, not what a device does.” Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). (emphasis in original)

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

The prior art teachings of Eigen et al differ from the claimed invention as follows:

For *claim 1-7*, Eigen et al is deficient in that it does not specifically teach the use of a “permeable film” that can selectively permit transport a reactant gas into the one cell while preventing transport of a reaction product out of the cells. Eigen et al is also deficient in that it does not teach a permeable polycarbonate film that selectively admits transport of oxygen and carbon monoxide and prohibits transport of a diary carbonate. Eigen only teaches the use of a polycarbonate film that covers the wells of the polycarbonate substrate wherein the film is 0.1 mm thick (see Eigen et al, column 8, paragraphs 1, 4 and 6).

Eigen et al is also deficient in that it does not teach a permeable film that is characterized by a diffusion coefficient of  $5 \times 10^{-10}$  to  $5 \times 10^{-7}$ ; or of  $1 \times 10^{-9}$  to  $1 \times 10^{-7}$ ; or of  $2 \times 10^{-8}$  to  $2 \times 10^{-6}$  cc(STP)-mm/cm<sup>2</sup> – sec cm-Hg. Furthermore, Eigen et al is deficient in that it does not teach a permeable film that is between .0002 to .05 mm; or

between .005 to .04 mm; or between .01 to .025 mm thick. Eigen et al only shows polycarbonate films that are 0.1 mm thick.

However, the combined teachings of Bottenbruch et al and Bayer teach the following limitations that are deficient in Eigen et al:

For *claims 1-7 and 10*, Bottenbruch et al (see entire document) teaches the use of polycarbonate monofilms that are commercially available at .002 mm thickness (e.g., Makrofol from Bayer) and also provide several other examples wherein the thickness is less than .002 mm e.g., .1  $\mu\text{m}$  (see Bottenbruch et al, column 1, lines 47-50; see also Examples 1-3 and claim 3). Furthermore, Bottenbruch et al teaches that these polycarbonate films are permeable especially to oxygen and carbon dioxide and that this “permeability is inversely proportional to the thickness of the film” (see Bottenbruch et al, column 1, paragraphs 4-5; see also column 4, paragraph 4) (see also Bayer, page 2, column 2 showing various thickness for the polycarbonate film).

The limitations wherein the film “selectively permit transport of a reactant gas into the one cell while preventing transport of a reaction product out of the cells” and “selectively admits transport of oxygen and carbon monoxide and prohibits transport of a diary carbonate” in claim 1 are also anticipated because these limitations are inherent properties of the “polycarbonate film” disclosed by Bottenbruch et al and Bayer or, in the alternative, would be construed as functional language describing a use of the apparatus, which wouldn’t further limit the scope of the claimed invention. See MPEP § 2114:

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). “[A]pparatus claims cover what a device is, not what a device does.” Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). (emphasis in original)

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

However, in the alternative that the functional language in claim 1 (e.g. the selective permeability) is to be considered as additional limitations for claim 1, the claimed invention would still be anticipated by the combined teachings of Bottenbruch et al and Bayer. For example, Bottenbruch et al and Bayer teach the same polycarbonate film with the same thickness as that claimed by applicant. Furthermore, Bottenbruch et al teaches that the permeability depends on the thickness and shows that their polycarbonate membrane is selectively permeable to oxygen and carbon monoxide (see Bottenbruch et al, column 1, lines 47-50; see also Examples 1-3 and claim 3; see also column 1, paragraphs 4-5; see also column 4, paragraph 4; see also Bayer, page 2, column 2 showing various thickness for the polycarbonate film). Although Bottenbruch and Bayer never explicitly state that their polycarbonate films would not be permeable to larger hydrocarbons like diaryl carbonate, the permeability is expected to be the same as that disclosed by applicant because the film is made out of the same polycarbonate material and has the same thickness as that claimed by applicants. Furthermore, Bottenbruch et al provides examples of other hydrocarbons i.e., propane and natural gas (see Bottenbruch et al, column 4, lines 40-41) that have significantly lower permeability than oxygen and carbon dioxide which would further indicate that larger hydrocarbons like diaryl carbonate would not be permeable. "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655,

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1658 (Fed. Cir. 1990). The Office does not have the facilities to make such a comparison and the burden is on the applicants to establish the difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray*, 10 USPQ 2d 1922 1923 (PTO Bd. Pat. App. & Int.).

Furthermore, the limitations of diffusion (see claims 2-4) are also met because Bottenbruch et al teaches that the diffusion coefficient is an inherent property of the polycarbonate material and its thickness (see Bottenbruch et al, column 1, paragraphs 4-5; see also column 4, paragraph 4) and, as a result, the polycarbonate films disclosed by Bottenbruch et al and Bayer must have the same diffusion coefficients because they are made of the same material and have the same thickness. "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). The Office does not have the facilities to make such a comparison and the burden is on the applicants to establish the difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and *Ex parte Gray*, 10 USPQ 2d 1922 1923 (PTO Bd. Pat. App. & Int.).

It would have been obvious to one skilled in the art at the time the invention was made to make a polycarbonate microtiter plate with a polycarbonate film covering as taught by Eigen et al with the thinner gas permeable polycarbonate film as taught by Bottenbruch et al and Bayer because Bottenbruch et al teaches that these thinner polycarbonate films were commercially available at the time of the Eigen et al invention and that the invention of Eigen et al specifically requires the use of polycarbonate films,

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which would direct a person of skill in the art toward commercial sources of the film. Furthermore, one of ordinary skill in the art would have been motivated to use the apparatus as taught by Eigen et al with the thinner polycarbonate films as taught by Bottenbruch et al and Bayer et al because of cost savings and convenience (i.e., commercial availability) and also because of the favorable properties of the thinner films (e.g., gas permeability, ease of manufacture, high heat distortion point, electrical insulating capacity, favorable dielectric constant) (see Bottenbruch et al, column 1, see also Bayer entire document). Furthermore, one of ordinary skill in the art would have reasonably expected to be successful because Bottenbruch et al teaches several successful examples of making thin gas permeable polycarbonate films and Bayer shows their commercial success and Eigen et al teaches that polycarbonate films can be used to cover their disclosed polycarbonate microtiter plates (see Bottenbruch et al, Examples 1 and 2; see also Eigen et al, entire document, see Bayer, entire document).

#### *Status of Claims/Conclusion*

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon D Epperson whose telephone number is (703) 308-2423. The examiner can normally be reached Monday-Friday from 8:30 to 4:30.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (703) 306-3217. The fax phone numbers for the

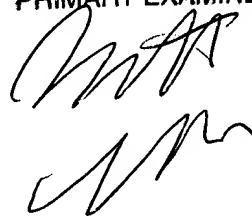
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organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

17. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2439.

Jon D. Epperson, Ph.D.  
March 22, 2003

BENNETT CELSA  
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Bennett Celsa', is written over the printed name and title.